CHAPTER 1
Introduction

The population of the Kissimmee Basin Planning Area is expected to grow between 2000 and 2025 by nearly 150 percent, increasing to more than 1.1 million residents. Corresponding water supply and demand projections for the current 20-year planning horizon indicate traditional fresh groundwater and surface water sources will not continue to satisfy the region's water use. This 2005–2006 Kissimmee Basin Water Supply Plan Update supports the 2000 Kissimmee Basin Water Supply Plan (2000 KB Plan) findings and recommendations, which call for alternative water sources to supplement the region's existing water supply.

Working closely with the South Florida Water Management District (SFWMD or District), local governments and water suppliers play a key role in identifying the water supply projects that have been or will be incorporated into their local comprehensive plans. This 2005–2006 Kissimmee Basin Plan Update (KB Plan Update) incorporates current statutory requirements, outlines eligibility criteria for funding and provides regional project implementation strategies to planners, policy makers and utility directors.

The 2005–2006 KB Plan Update consists of this Planning Document, Appendices and a Consolidated Support Document. In addition, the accompanying CD contains electronic versions of this update package, as well as supporting studies, documentation, data and the previous 2000 KB Plan. This material is also available from the District's Water Supply Plan Web site at: http://www.sfwmd.gov/org/wsd/wsp.

PURPOSE

This 2005–2006 KB Plan Update addresses the anticipated water supply needs of the Kissimmee Basin Planning Area for the next 20 years and how these needs will be met through the development and funding of traditional and alternative water supplies (AWS). It identifies areas where traditional sources of water will not be adequate to meet future demands and presents viable water source options to meet future demands. In addition, this KB Plan Update contains a list of AWS projects for Fiscal Years 2006–2025. Projects listed in this plan are eligible for cost-sharing consideration through a separate annual funding process.

Revisions to Florida Water Laws

Section 373.0361(1), Florida Statutes (F.S.), The governing board of each water management district shall conduct water supply planning for any water supply planning region within the district identified in the appropriate district water supply plan under s. 373.036, where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period.

The legal authority and requirements for water supply planning are included in Chapters 373, 403 and 187 of the Florida Statutes. During the State of Florida's 2005 legislative session, lawmakers revised state water law. Several growth management-related bills were signed into state law and the Water Resource Protection and Sustainability Program was created. This program is intended to reduce competition for available water by encouraging the development of alternative water supplies, while still providing protection for the natural systems. Chapter 4 of the *Consolidated Water Supply Plan Support Document* (SFWMD 2005–2006) describes the Water Resource Protection and Sustainability Program.

The new statutory provision strengthens the link between regional water supply plans and the potable water provisions contained within each local government's comprehensive plan. The program is intended to ensure permitted water supply and potable water facilities are available for new development in a timely manner. All local governments within the Kissimmee Basin Planning Area are now required to prepare 10-Year Water Supply Facility Work Plans and adopt revisions to their comprehensive plans within 18 months following the approval of a regional water supply plan.

The Water Resource Protection and Sustainability Program and its accompanying trust fund allocate annual revenues to support alternative water supply development, such as desalination, use of reclaimed water and new storage capacity. These state funds, matched with water management district budgeted funds, are specifically for cost-sharing project construction costs for alternative water supply projects. The program also adds permitting incentives for water providers selecting projects recommended by the water supply plans.

Role of the South Florida Water Management District

The South Florida Water Management District (SFWMD or District) performs water supply planning for each region within its jurisdiction. The District's mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems and water supply. The agency serves local governments by supporting their efforts to safeguard existing natural resources and meet future water demands.

Regional Water Supply Plans

The SFWMD prepares water supply plans for each of its four planning areas to effectively support planning initiatives and address local issues. The regional water supply plans encompass a minimum 20-year future planning horizon and are updated every five years. Each regional water supply plan update provides revised water demand estimates and projections; an evaluation of existing regional water resources; identification of water supply related issues; a discussion of present water source options; water resource and water supply development components including funding strategies; and, recommendations for meeting projected demands for the region. In addition, the 2005–2006 KB Plan Update includes a discussion of minimum flows and levels (MFLs) established within the planning area; MFL recovery and prevention strategies where appropriate; technical data and support information.

PLAN GOAL AND OBJECTIVES

The SFWMD's strategic goal for all of its water supply planning efforts is to ensure an adequate supply of water to protect natural systems and to meet all existing and projected reasonable-beneficial uses, while sustaining water resources for future generations. Additionally, an objective of the 2005–2006 KB Plan is to identify sufficient sources of water to meet the needs of all reasonable-beneficial uses within the KB Planning Area for the year 2025 during a 1-in-10 year drought event, while sustaining the region's water resources and related natural systems.

2005–2006 Kissimmee Basin Plan Objectives

As part of the planning process, the public was asked to assist the SFWMD in defining the 2005–2006 KB Plan Update's objectives. At regional Water Resource Advisory Committee (WRAC) Issue Workshops, District staff and stakeholders developed the following objectives for this plan update, which provides an overall framework for the region's water supply planning process:

- Identify alternative water supply resources where deemed necessary.
- Protect natural systems from harm due to water uses.
- Provide options for a 1-in-10 year level of certainty for all reasonable - beneficial uses of water.
- Promote compatibility of plan with tribal and local government land use decisions.
- Promote compatibility and integration with other State and Federal regional water resource initiatives.
- Promote water conservation and efficient use of water resources.

- Refine water supply demand projections for average and 1-in-10 year level of certainty.
- Identify adequate funding to support identified water resource development and supply development projects.

Figure 1 shows the Planning Area in relation to the SFWMD and other water management districts.

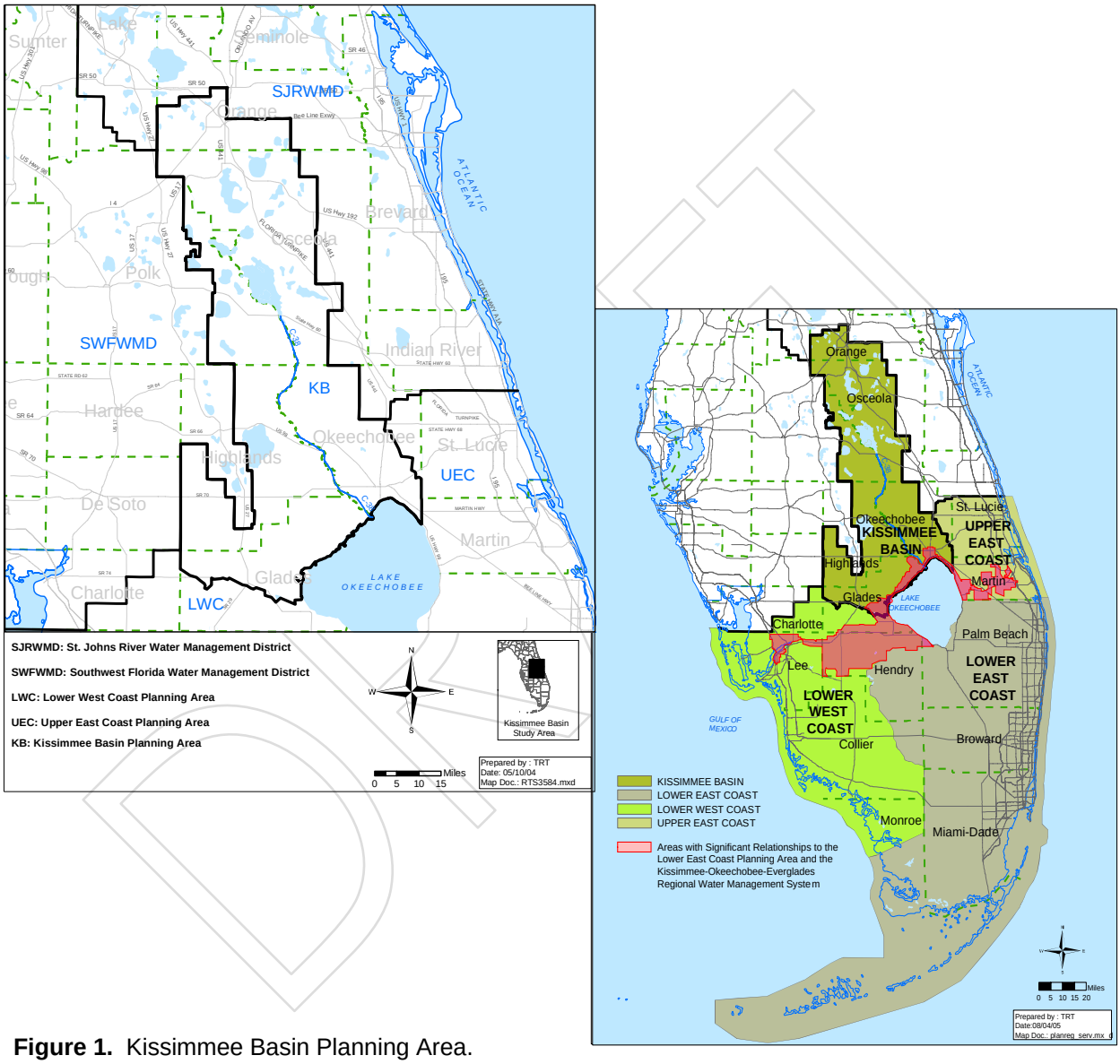

Figure 1. Kissimmee Basin Planning Area.

[@ Designer note: Place the following planning area facts around maps on map page]

The boundary of the Kissimmee Basin (KB) Planning Area generally reflects the drainage basin of the Kissimmee River. The KB Planning Area encompasses the portion of the SFWMD extending from southern Orange County, through the Kissimmee Chain of Lakes and the Kissimmee River, to the north shore of Lake Okeechobee. The area includes parts of Orange, Osceola, Polk, Highlands, Okeechobee and Glades counties. The northern and eastern portions of the boundary are adjacent to the St. Johns River Water Management District. And, the planning area's western boundary borders the Southwest Florida Water Management District. Orlando and portions of Orange County reside in multiple water management districts.

- The KB Planning Area is 3,490 square miles.
- Area population is expected to exceed 1.1 million by 2025 (U.S. Bureau of the Census 2001). Over 90 percent of this growth will be in the northern portion of the basin.
- The metro-Orlando area (Orange, northern Osceola and northeast Polk counties) is undergoing rapid urban growth.
- Moderate urban growth and increased agricultural activity is expected for Okeechobee, Glades and Highlands counties.
- Groundwater from the Floridan Aquifer is the primary source of water for the northern basin; and, surface water from Lake Istokpoga and Lake Okeechobee are the southern basin's traditional water sources.
- Alternative water sources include such sources as reclaimed water and surface water for the northern portion of the basin and additional groundwater from the Floridan Aquifer in the southern portion of the planning area.

Projections for 2025 indicate average annual water demand will increase 64 percent to approximately 430 million gallons of water per day (MGD). Urban related water demands during that timeframe will increase to 314 MGD with Public Water Supply surpassing Agriculture as the area's largest water consumer. Agricultural demands will increase only slightly from 115 MGD to 118 MGD overall. One in ten year drought water demands are projected to reach 524 MGD by 2025. County population data and related water usage is discussed in detail in **Chapter 2**, Demand Estimates and Projections.

PLANNING PROCESS

Planning efforts for the 2005–2006 KB Plan Update integrated development of 2025 demand projections; assessment of existing and projected resource conditions; and, formulation of strategies to meet urban, agricultural and environmental water needs. The SFWMD conducted analyses to measure the impacts of projected demands on available water resources and related natural systems within the southern portions of the planning area.

Public Participation

The process for development of the 2005–2006 KB Plan Update involved several public participation meetings and coordination with local governments and other agencies. The SFWMD established the Water Resources Advisory Commission (WRAC) to serve as an advisory body to the Governing Board. The WRAC is the primary forum for conducting workshops, presenting information and receiving public input on water resource issues affecting south Florida. Commission members represent environmental, urban and agricultural interests from all four of the District's water supply planning areas.

The SFWMD held Water Supply Plan WRAC Issue Workshops throughout the water supply planning process. A cross-section of regional stakeholders attended the WRAC workshops. Industrial representatives provided their review and comments for projected demands compiled by District staff. Meetings were also held by local government planning departments and utilities to discuss water demand projections and coordinate planning processes.

Coordination with Other Partners

The SFWMD also works in cooperation with the adjacent St. Johns River Water Management District and the Southwest Florida Water Management District. Jurisdiction boundaries of the three districts actually split the greater metropolitan Orlando area and multiple counties within the Kissimmee Basin.

Representatives of all three water management districts and the Florida Department of Environmental Protection (FDEP) attended several regional water supply workshops and subgroup meetings. Coordination between districts also occurs with water resource investigation, planning, regulation and water shortage declarations. A Memorandum of Understanding (MOU) between the three districts outlines terms of the agencies' formal collaboration, processes and agreements.

Seminole Tribe Agreement

The Seminole Tribe of Florida, the State of Florida and the SFWMD executed a Water Rights Compact in 1987. The Compact provides a framework for harmonizing the relationship between the Tribe, State of Florida and the District on issues concerning water resources. Of particular importance to the KB Plan are the Compact provisions concerning the Tribe's Brighton Reservation water entitlement.

The Brighton Reservation water entitlement was further detailed in an agreement, which was executed, by the Tribe and the SFWMD in November 1992, after publication of a District technical report. This agreement outlines surface water control strategies to assure maximum reliability of delivering the 15 percent water entitlement set forth in the Compact for the Brighton Reservation, which is located in Glades County. The Agreement also outlines the schedule of releases from Lake Istokpoga and operation schedules for the pumps at the S-71 and S-72 structures. The proposed development of the Southern Indian Prairie Basin Operation Plan has direct bearing on this agreement and is further explained in **Chapter 3**, Resource Analysis.

2000 PLAN ACCOMPLISHMENTS

In preparing the 2000 Kissimmee Basin Water Supply Plan (KB Plan), the planning process analysis identified key regional issues. These included a significant increase in demand for public water supply use in the northern portion of the basin, limitations placed on surface water withdrawals in the Indian Prairie Basin, and, potentially harmful environmental impacts to lakes, springs and wetlands.

To resolve these issues, the 2000 KB Plan contained seven strategies, which were organized into a series of recommendations and related project tasks. Responsibility for the development of each of the plan's projects required local and regional stakeholder participation.

Twenty-three of the 30 tasks outlined in the 2000 KB Plan were initiated during plan implementation. Five tasks were not implemented due to funding shortfalls or as new information rendered specific projects economically or technically infeasible. Major efforts initiated since development of the 2000 KB Plan include:

- Completion of the Regional Reuse Plan
- Evaluation of Storm Water Systems
- Surface Water Studies
- Floridan Aquifer Modeling
- Revision of the Operational Plan for the Indian-Prairie Basin
- Investigation of the Kissimmee River for Supply
- Investigation of Regional Storage Options

- Increased Regulatory and Planning Coordination Among Districts

The Five-Year Water Resource Development Work Plan, contained in the annual SFWMD South Florida Environmental Report, Volume II, summarizes the progress of these recommendations. As projects are completed or changed, information contained in the report also changes. **Appendix C** tracks all the projects as they were originally detailed in the 2000 KB Plan.

Reclaimed Water

Reclaimed water is expected to play an increasingly significant role in meeting future water demands of the Kissimmee Basin Planning Area. Central Florida is among the nationwide leaders in using reclaimed water for potable replacement and aquifer recharge.

Strategy 1.0 identified by the 2000 KB Plan addressed minimizing Floridan Aquifer drawdown through recharge within Orange, Osceola and western Polk counties. Recommendation 1.1 focused on reclaimed water use planning and consisted of three major components: development of a reuse plan, hydrologic investigations of the shallow aquifer and a pilot project involving direct injection of reclaimed water into the Floridan Aquifer System.

The 2005 Central Florida Regional Reuse Evaluation, completed by the SFWMD, concluded reclaimed water availability is projected to increase 98 percent for the study area by 2025 for a total of 244 MGD. Potential demand for reclaimed water for the same period is estimated to increase to an excess of 261 MGD. Nearly all reclaimed water providers have identified a plan to maximize their projected reclaimed use as part of their alternative supply strategy. Additionally, aquifer recharge was determined to be a beneficial use of reclaimed water in the central Florida area. The completed study also identifies, by utility, possible reuse demand, locations and system improvements that can help maximize reclaimed water use in the future. A copy of this report is included in **Appendix H**.

The second component of this effort involved investigating the connection of Surficial and Floridan aquifers in central Florida to gain greater insight into the benefits of reclaimed water use for aquifer recharge. This study also contributed to the District's understanding of the aquifer connection in the planning region. From 2002 to 2005 the SFWMD invested nearly $1.1 million to place a paired shallow and Floridan Aquifer wells at 32 sites. Each station contains continuous water level recorders monitored by the District.

The third element of the 2000 KB Plan Recommendation 1.1 was a feasibility assessment on the injection of potable quality reclaimed water into freshwater portions of the Floridan Aquifer. In 2002, the SFWMD conducted a Preliminary Assessment of Indirect Potable Reuse and Aquifer Injection Pilot Study, in partnership with Orange

County Utilities, at a cost of over $42,600. The study focused on the identification of regulatory and hydrologic concerns over indirect potable reuse and provided preliminary design of a nano-filtration and UV treatment system for further investigation. This study led to a follow-up pilot study of the proposed treatment process initiated by Orange County.

Storm Water

Recommendation 1.2 was related to storm water reuse, which like reclaimed water, could potentially offset fresh water withdrawals from the Floridan Aquifer. Efforts undertaken for the Kissimmee Basin Planning Area included evaluations of the regional stormwater drainage systems; the regulatory, water quality and recharge aspects of drainage wells; and, alternative treatment methods for storm water entering drainage wells.

From 2001 through 2003, the SFWMD participated in an Artificial Recharge Project, led by the St. Johns River Water Management District, which reviewed passive treatment options for lake and street drainage wells. The project also studied methods for maximizing recharge through infiltration basins. Initial results showed bacterial components rapidly disappeared, but other chemical components, including arsenic, had longer residence times. The SJRWMD has made progress in monitoring the fate of chemical and biological contaminate concentrations of injected stormwater drainage wells and is continuing ongoing water quality monitoring for the project.

Also, in 2002, the SFWMD initiated a survey of stormwater drainage wells with the SJRWMD and Orange County Utilities. The purpose of the study, completed in February 2003, was to create a GIS-based inventory and database of information on central Florida's 300 plus drainage wells. Many of the wells have been in place since the 1960's and they provide an estimated 20 MGD of aquifer recharge. A local consulting firm inspected the wells and completed an inventory of the drainage wells located in Orange, Seminole, Lake and Osceola counties. This inventory was also used to address needed maintenance issues on some wells and helped identify potential sites for the storm water treatment portion of the study.

In 2004 and 2005 the Nashville Street drainage well was selected as the site for testing a combined storage area and storm-scepter ™ concept to improve water quality. The construction, done in conjunction with Orange County, was completed in 2005. Water quality sampling is ongoing by the county to determine possible water quality improvements resulting from the installation.

Conservation

The 2000 KB Plan's Strategy 2.0 and its corresponding Recommendation 2.1 relate to conservation. In 2002, the District established an organizational unit within its Water Supply Program to address water conservation initiatives. This new division

manages the Alternative Water Supply Funding Program, Mobile Irrigation Labs and the Water Savings Incentive Program (WaterSIP). The WaterSIP funds local conservation initiatives, such as weather station irrigation controllers, toilet retrofit and outreach programs.

The Alternative Water Supply (AWS) Grant Program was opened to the Kissimmee Basin Planning Area in 2003. Over $2 million in project funding has been awarded since the program's inception. Although the staff has worked with utilities to identify opportunities for water conservation through both the conservation and regulatory divisions of the SFWMD, no grants have been provided for tracking of the development of individual water conservation plans.

District staff members are actively involved in the Florida Water Conservation Initiative led by the Florida Department of Environmental Protection. And, the SFWMD continues to participate on the Statewide Reuse Coordinating Committee to discuss statewide reuse issues.

Surface Water

The SFWMD conducted evaluations of Lake Tohopekaliga, East Lake Tohopekaliga and its tributaries, Boggy and Shingle Creeks, all part of the Kissimmee Chain of Lakes system. The study, which provides a preliminary estimate on the availability of supplies from the system, was completed in 2005. Results of the study suggest significant volumes of water might be withdrawn from the Kissimmee Chain of Lakes, while causing limited changes to the identified environmental criteria. The findings also show this source is drought prone and development of storage is likely an important component of source reliability. Shingle and Boggy Creeks are slightly more reliable sources potentially yielding and average of 6 MGD and 4 MGD respectively. An Executive Summary of these studies is located in **Appendix I.**

In a related project, the SFWMD sponsored the Toho Water Authority's efforts to develop water supplies from Shingle Creek as a supplemental source of reclaimed water in 2003, 2004 and 2006. Estimated water generated from this effort is 4.0 MGD. District funding exceeded $1.1 million dollars for the project during fiscal years 2003 through 2006.

Beginning in 2003, the SFWMD entered into an agreement with the City of Kissimmee (later the Toho Water Authority) to construct facilities to withdrawal up to 4 MGD from Shingle Creek for use in reuse augmentation and groundwater recharge. The District also sponsored this project in 2004 through 2006. The project is scheduled to be complete and online in 2006.

Additionally, following 2000 KB Plan recommendations, the SFWMD coordinated efforts with the St. Johns River Water Management District to investigate water resource development opportunities using surface water supplies from the St. Johns

River. The largest of these projects is the St. Johns River / Taylor Creek Project, which is estimated to supply 45 MGD.

Groundwater Resources

The SFWMD budgeted over $3 million dollars (fiscal years 2000 through 2006) for the construction and testing of a series of wells designed to obtain new information on the Floridan Aquifer System in central Florida, particularly the lower portion of the aquifer. Thirteen wells were constructed and tested in the Floridan Aquifer. Six of the wells were constructed into Lower Floridan Aquifer. These sites were constructed in cooperation with Reedy Creek Improvement District, Orange County, Orlando Utilities Commission and the SJRWMD.

Alternative Water Resources

Part of Strategy 3.0 of the 2000 KB Plan recommended the investigation of surface water bodies within the planning area to determine the availability from these sources. See the discussion of the evaluations of Lake Tohopekaliga, East Lake Tohopekaliga and its tributaries, Boggy and Shingle Creeks under the preceding Surface Water section for more information on this accomplishment. Continued efforts to evaluate the potential availability of these sources have been combined with the SFWMD's effort to modify its management plan for the Kissimmee Chain of Lakes.

In the 2000 KB Plan, Strategy 4.0 and its related recommendations prescribed pursuit of water resource development solutions involving water supplies originating from Lake Okeechobee and the Kissimmee River. Strategy 5.0 addressed development of a water management plan for the Lake Istokpoga–Indian-Prairie Basin.

The revised operational plan for backpumping water from Lake Okeechobee into the lower Indian-Prairie Basin is under development. Investigation of the Kissimmee River as an alternative water resource was combined with efforts to model the Kissimmee River system currently underway as part of the Kissimmee Basin Hydrologic, Modeling and Operations Study (KBMOS) Study.

Lake Istokpoga had been identified as a water source to supply expanding agricultural demands in the southern portion of the Kissimmee Basin Planning Area. As one of the recommendations of the 2000 KB Plan, the SFWMD performed a comprehensive evaluation of the lake basin resources to devise an improved operations plan to improve water supply deliveries. Additionally, the SFWMD installed two new water level monitoring stations on Lake Istokpoga at a cost of approximately $60,000. These stations will improve the District's ability to monitor lake levels and make operational decisions based on this information.

Related Implementation Strategies

Each year the District updates the list of priority water bodies for the establishment of Minimum Flows and Levels (MFLs). In December 2005, the SFWMD adopted an MFL for Lake Istokpoga. The most recent MFLs priority list postponed the setting of MFLs for the Kissimmee River, Lake Kissimmee, Cypress Lake, Lake Rosalie, Lake Marion, Lake Jackson and Lake Hatchineha to beyond 2010. The lack of existing or immediately projected consumptive use demands indicated it was appropriate to delay establishing these MFLs. Setting a minimum level for the Floridan Aquifer in central Florida was postponed indefinitely to allow for the gathering of additional information to specify such an MFL.

Another recommendation from 2000 involved a review of surface water storage options, such as a regional reservoir or Stormwater Treatment Area (STA), to improve water supply dependability within the Indian-Prairie Basin in Glades and Okeechobee counties. The SFWMD's regulatory staff worked with individual farmers to create storage areas to retain water on specific sites. Work on a regional reservoir was deferred until the Lake Okeechobee Watershed Project (LOWP), led by the U.S. Army Corps of Engineers, identifies a suitable location for the reservoir north of Lake Okeechobee.

Regulatory and Inter-District Coordination

Recommendations based on strategies 6.0 and 7.0 in the 2000 KB Plan emphasized the need for better coordination. A Memorandum of Understanding (MOU) between the SFWMD and the Kissimmee Basin's neighboring water management districts the SJRWMD and SWFMWD has been in place since 2000. The MOU was updated in 2003.

SUMMARY

The 2005–2006 Kissimmee Basin Plan Update represents an update to the 2000 Kissimmee Basin Plan. Many of the objectives of the 2000 KB Plan were met and helped in the development of this plan update. Since the initial development of the 2000 KB Plan, several legislative changes have occurred to link the findings of subsequent planning efforts to local government comprehensive planning efforts. Most notably the development of a Ten-Year Water Facility Work Plan required within 18-months after the completion of this plan update.

REFERENCES CITED:

Department of Community Affairs, Department of Environmental Protection and South Florida Water Management District. 2002. *Agency Coordination of Comprehensive Planning and Water Supply Planning in Florida*. Available from: http://www.sfwmd.gov/org/wsd/ear/pdf/dcawhitepaper11-02.pdf.

South Florida Water Management District. 2005–2006. *Consolidated Water Supply Plan Support Document*, Water Supply Department, SFWMD, West Palm Beach, FL. vari. pag.